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Lard or tallow will assume the appearance of a soft grease.

The part of the work devoted to the Quantitative Analysis is excellently written, disclosing at once that the author is thoroughly familiar with the work. The latest researches are carefully quoted and criticised, the criticisms being usually strengthened by results obtained in his own laboratory. We refer the reader especially to Twitchell's method for the determination of Resin Acids. On p. 196 he says: "Of all the methods proposed hitherto for the estimation of resin acids in mixture with fatty acids, that recommended by Twitchell yields the best results, and should therefore be used to the exclusion of the methods described before. The results, however, must not be considered as absolutely correct; they are only approximate, as Lewkowitsch has shown by an exhaustive examination of both the volumetric and gravimetric processes." The author then gives a series of tables giving the results of this work. Dr. Lewkowitsch's assumption that the reason for the results by this process, being only approximate, is due to the action of hydrochloric acid upon the resin, has since the publication of this work been shown to be wrong. Evans and Beach in a recent publication have shown that the low results obtained by the gravimetric process is due to a large percentage of unsaponifiable matter in the resin. They found as high as 9 per cent. of unsaponifiable matter in one resin.

The Chapters IX., X., XI. and XII. are almost entirely rewritten and contain much original work. The sulphur chloride test for drying oils offers many interesting points of inquiry. In the table given on p. 228 we find that tallow and lard do not thicken with  $S_2 Cl_2$ , and that the resulting product is entirely soluble in carbon bisulphide, whereas on p. 229 we find in another table that tallow oil and lard oil (products obtained by pressure from tallow and lard)

solidify with  $S_2 Cl_2$  after 12 and 10 minutes respectively and form products not completely soluble in carbon bisulphide. In summing up the results of the various investigations on 'Color Reactions,' Dr. Lewkowitsch said that the results on all color reactions should be taken with the greatest caution and mention should be made that the test for cotton seed oil with nitric acid which the author so forcibly recommends be included. The descriptions of the various oils, fats and waxes are very complete. The part given to cotton seed oil is especially so. In this one description we find twenty-three different publications referred to, including articles from American, English, German, French and Italian journals.

We are very sorry to find Dr. Lewkowitsch follows the footsteps of so many European chemists, decrying everything foreign. We should be pleased to know his authority for the following: (p. 460) 'in America adulteration has become an openly acknowledged practice,' etc. It simply points out to the American reader the customary ignorance of foreigners regarding our laws on the subject of adulteration. In Chapter XII., devoted to Technical and Commercial Analysis, lard and lard substitutes are dismissed with two and one-half lines. It is upon this very subject that a well directed system of investigations is necessary, and to judge by the numerous cases of supposed adulterations at all times before the English courts, Dr. Lewkowitsch's works would be considered the better for it, and must be considered incomplete for the lack of it.

JOSEPH P. GRABFIELD.

CHICAGO, July 6, 1895.

#### SCIENTIFIC JOURNALS.

AMERICAN JOURNAL OF SCIENCE.

THE August number of the *American Journal of Science* opens with an article by

Frank H. Bigelow upon the 'Earth as a Magnetic Shell.' This is an investigation, largely theoretical, upon lines already followed by the author in earlier publications. In discussing the modes of transference of energy from the sun to the earth, he assumes, in addition to the electro-magnetic radiation emanating from the sun in all directions in straight lines, also a magnetic radiation belonging to the 'magnetic field,' which near to the earth is at right angles to the ecliptic. In this magnetic radiation are found the explanation of several sets of phenomena, as the aurora, magnetic disturbances, earth currents and meteorological periodic variations. This subject is discussed at length with the aid of a number of diagrams. The author concludes from the values obtained for the vectors of the polar magnetic field at the earth that there is an *exflected* system around the poles and an *inflected* system in the tropical belts. Further, he shows that the outer stratum, or shell, of the earth is permeable to external magnetic forces, while the nucleus is not; assuming that  $\mu = 2$ , the radius of the nucleus is calculated to be 3170 miles. The effect of the magnetic radiation argued for is discussed with reference to the several sets of phenomena mentioned, and it is also suggested that certain deviations from the Newtonian law of gravitation noted in the secular motions of the sun and the planets may find their explanation in a mechanical stress called out by this 'magnetic radiation.' Another physical article is by J. Trowbridge and W. Duane, who continue their discussion of the results obtained in the Jefferson Physical Laboratory in the experimental determination of the velocity of electric waves. The essential features of the methods employed have been earlier (April, 1895) described, but they are here improved upon. The final result for the velocity obtained is  $3.0024 \times 10^{10}$ , and the conclusion is reached that the velocity of

short electric waves traveling along two parallel wires differs from the velocity of light by less than two per cent. L. A. Bauer takes up anew the discussion of the distribution and secular variation of terrestrial magnetism—a subject treated by him in the thesis noticed in SCIENCE, Vol. I., No. 25—and reaches some important results to be extended in a following article; they may be more definitely spoken of later in connection with this. Two articles upon analytical chemistry come from the laboratory of F. A. Gooch at New Haven; the first, by Gooch and Phelps, is a discussion of a new method of determining carbon dioxide; the second, by Kreider, describes some new devices (as a hot filter, a valve, etc.) convenient in the laboratory. In the department of mineralogy, W. M. Foote describes leadhillite pseudomorphs from Granby, Mo.; W. H. Hobbs describes cerussite crystals from Missoula, Montana, barite and manganite from Negaunee, Michigan, chloritoid from Michigamme, Mich.; W. F. Hillebrand gives analyses of calaverite from Cripple Creek, Colorado. In petrology, L. V. Pirsson discusses the subject of complementary rocks and radial dikes. In the department of botany, B. L. Robinson and J. M. Greenman present a long article (42 pages, forming contribution No. IX., N. S.), from the Gray Herbarium, and containing descriptions of many new species. This consists of four parts, viz.: I. On the Flora of the Galápagos Islands, as shown by the collection of Dr. G. Baur; II. New and Noteworthy Plants, chiefly from Oaxaca, collected by Messrs. C. G. Pringle, L. C. Smith and E. W. Nelson; III. A Synoptic Revision of the Genus *Lamourouxia*; IV. Miscellaneous New Species. The number (108 pages) concludes with a notice of Professor Thomas H. Huxley by O. C. Marsh, and likewise one of Professor Daniel C. Eaton by W. H. Brewer.